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AUTHOR Bozeman, William; Hierstein, William J.
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ABSTRACT

These presentations offer information on the benefits of using computer-assisted instruction (CAI) for remedial education. First, William J. Hierstein offers a summary of the Computer Assisted Basic Skills Project conducted by Southeastern Community College at the Iowa State Penitentiary. Hierstein provides background on the funding for the project, the short time frame for planning and implementation, staffing, teacher training, software needs, and student reactions and outcomes. Quotations from project and prison staff, instructors, and inmates are provided, demonstrating the degree to which computer-assisted instruction gained support and generated enthusiasm even among those who were initially skeptical about the project. William C. Bozeman offers an overview of CAI, looking at different modes and features (e.g., drill and practice, tutorial programs, and simulations) and discussing the advantages and effectiveness of the approach. Finally, a software purchase list, including information on vendors and costs, is presented. (AYC)

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using the COMPUTER to improve BASIC SKILLS

USING THE COMPUTER TO IMPROVE BASIC SKILLS

Presented by

William Bozeman, Ph.D.
Professor of Education Administration
University of Central Florida
at Orlando

and

William J. Hierstein, Ph.D.
Assistant to the President
Southeastern Community College
West Burlington, Iowa

at the

1986 Annual Convention

of the

American Association of Community and Junior Colleges

Orlando, Florida

Based on findings from a Computer Assisted Basic Skills Instruction Project conducted at the Iowa State Penitentiary in Ft. Madison, Iowa by Southeastern Community College. The project was funded by the National Institute for Corrections.

USING THE COMPUTER TO IMPROVE BASIC SKILLS

by

William J. Hierstein

A summary of the Computer Assisted Basic Skills Project conducted by Southeastern Community College at the Iowa State Penitentiary.

The "state of the art" in computer assisted instruction (CAI) has developed over a period of the last 30 plus years. Like other data processing applications, its development has been rapid at times with dormant periods. Each advance in computer hardware has made possible a new quantum leap. With the advent of more powerful and dependable microcomputers the field of computer assisted instruction has finally come of age.

Recognizing the potential importance of CAI as a teaching tool for adults; the National Institute for Corrections (NIC) distributed a request for proposals in June, 1984, which invited the submission of proposals for Computer Training Initiatives. The grants awarded under this category of NIC's educational assistance program were limited to $60,000 with a grant period of one year.

A proposal for a Computer Assisted Basic Skills Project was prepared and submitted by Southeastern Community College of West Burlington, Iowa. The proposal requested assistance which would enable the College to implement a computer assisted basic skills program at the Iowa State Penitentiary complex located in Ft. Madison, Iowa where the College operates the educational programs through a contract with the Iowa Department of Corrections.

The project was viewed as an opportunity to breath new life into the already operating basic skills program which was primarily an individualized instruction program which was heavily oriented to printed materials. The CAI project was viewed as a way to supplement the existing program with more exciting media and to introduce a new instructional technology to the established program.

The proposal was prepared in a very short space of time by the author and Dr. William C. Bozeman (now of the University of Central Florida at Orlando). Because of the short timeline, it was not possible to do a thorough job of program development. The instructors in the program were not consulted and a bare minimum of input was received from correctional officials. Corrections officials were primarily interested in ensuring that the computer equipment installed would not be compatible with mainframe systems operating within the prison complex. Once assurances were given that the equipment involved in the CAI project would not have the capability of accessing corrections and state financial systems; corrections officials encouraged submission of the proposal and provided letters of support. The proposal was submitted to NIC on June 28, two days before the deadline.

The College was notified that the proposal would be funded in mid-August and immediately made plans to implement the project. The three instructors involved in the project (Thomas Hayes, June Mudd, Jerry Schulz) were introduced to the idea by Charles Schulz, the Director of Correctional Education Programs, and the author in early September. They greeted the idea with "reserved enthusiasm." All were open to the idea of change, but only one of the three had any previous experience with computers. They were assured that they would receive training and that a computer lab monitor would be hired to provide technical assistance and other support for the project.

Bill Bozeman, then of the University of Iowa, agreed to serve as consultant for the CAI project and to prepare the inservice programs for the instructors and administrator involved.

Specifications for the purchase of 28 Apple IIc computers were prepared and sent to NIC for approval. It was at this point that a major snag was encountered. NIC had anticipated that computer equipment used in the program would be leased and for a time believed that their funding from Congress expressly prohibited the purchase of such equipment. The College, of course, was not interested in installing a CAI program in 1984 to have it terminated in 1985 because the lease expired and local funding would not support its renewal. A compromise was eventually reached. NIC agreed to allow a lease/purchase agreement with a one dollar per computer unit purchase option at the conclusion of the grant period. The delay, however, had pushed delivery of the equipment back to mid-January.

The inservice for the instructors and administrator began with a two-day workshop held on the University of Iowa campus in Iowa City, Iowa. Since the Apple IIc computers which would be used in the project had not yet been delivered, other Apple computers were rented for the workshop.

The workshop was devoted to introducing the concept of CAI to the persons who would soon be asked to put the concepts into practice. The instructors approached the workshop with both apprehension and great interest. A portion of the workshop was devoted to familiarizing the instructors with the computer and its potential for instruction. Selected software was given them for review. As the workshop concluded, the instructors were enthusiastic about the potential of the computer as an instructional tool. Even Tom, who had been the most skeptical, grudgingly admitted that he had learned a great deal and was willing to go on with the project.

At the conclusion of the first workshop, planning was done for a second, more intensive three-day workshop to be held in mid-January on site at the penitentiary. The second workshop, which began on January 16, was devoted to furthering the computer literacy of the instructors and the recently hired computer lab monitor (Rita Pierson) and to reviewing additional software in preparation for the implementation of the project in mid-February. Considerable time was spent in role playing the start up procedure and student orientation to the computer.

On February 15, one-half of the students were given an orientation to the computers. With all the staff and the consultant present that first group of inmate students entered the computer age. The Apple Orientation and Apple at Play disks were used for the orientation. The students were immediately enthusiastic. In the next weeks, all the students enrolled in the adult basic education component were introduced to the computer.

Initially, in addition to the inexperience of both the instructors and the students, the most serious problems were a shortage of useful software and the unfamiliarity of the instructors with those materials that were available. Orders for software had been placed, but delivery was slow.

To fill the gap, a small sampling of basic skills CAI materials was obtained from another local administrative agency. These materials, produced by the Minnesota Educational Computing Consortium (MECC) were found to be of generally good quality and it was discovered that the College could obtain them for the cost of reproduction under a licensing agreement with a statewide computer software consortium. A more complete set of these MECC materials were obtained and served as the basic materials for the program until other materials could be obtained. The problem of the unfamiliarity of the instructors with the software available was only solved through the extra effort of the three instructors. During the initial months of the project all three instructors and the laboratory monitor spent many hours reviewing and evaluating the software.

Looking back at the early days of the project, the author can only attribute the successful implementation of the project to the dedication of all involved. Given the speed with which the program was implemented, the initial unfamiliarity of the instructors with CAI, and the fact that the program was implemented in one of the most difficult educational environments imaginable; the program had a tremendous potential for failure. The fact that it did not can only be accounted for by recognizing that all involved were determined to make it work.

The enthusiasm of the instructors was due in large measure to the skillful introduction of CAI during the workshops. Dr. Bozeman was assisted in the project by Jess House, a graduate student, who later served as project consultant after Bozeman's departure for Florida. Their frequent visits to the classroom during the first weeks of operation also served to sustain the enthusiasm and smooth out the rough spots.

The reaction of the students to the introduction of the computer into the learning environment of the prison also served to sustain the project. From the outset the students were unbelievably positive. The introduction of a new technology into the environment of the oldest penal institution west of the Mississippi had a startling effect. By the time the students were finally allowed into the computer lab they were more than primed to begin learning with the computer and applications to enter the program showed a remarkable increase.

The students who initially entered the program were pretested using the Test of Adult Basic Education (T.A.B.E.). Due to the rapid turnover of inmates in the program, only 40 percent were still in the program three months later when an alternate form of the T.A.B.E. was used as a post test. The progress made by the students tested was statistically significant. It was also noted that four of the students who were the most avid computer users made the most significant gains. There were also several students who left the program because they had completed their GED but were withdrawn before the post test could be administered.

The project implementation was not without difficulty, there were problems and setbacks and even a couple of potential calamities. A leaking roof in the John Bennett Correction Unit caused the project at that site to be shutdown for a short time. The delay in the delivery of software caused complaints of lack of support among the instructors. The departure of the consultant for a new position in Florida and the necessity of finding a replacement for the final months of the project could have presented a serious problem. All of these problems were successfully overcome.

Other instructors not involved in the project became interested in the use of the computers in their area of instruction. The Welding Program instructor, with the aid of the computer laboratory monitor, developed a computer management package to track the competencies attained by students in the program. The Graphic Arts Program instructor began using the computer to introduce his students to electronic typesetting and to prepare inventories and inter-institutional bills for printing services. Software was identified that served to teach related mathematics and technical writing skills required in several of the vocational education programs.

The grant period was scheduled to end in October, 1985, but an extension was granted which allowed the project to purchase and evaluate additional software. The grant expired on January 31, 1986, but there was little notice except by the author, who was responsible for completing the final reports to NIC. The final date was of no import to the instructors or students because the on-going expense of the program has been picked up by the corrections authorities as an established line item within the educational program budget.

The Computer Assisted Basic Skills Project has terminated, what remains is a computer assisted basic skills component integrated into the on-going programs at the Iowa State Penitentiary.

ANECDOTES

The following collection of anecdotes are excerpts from a case study evaluation report prepared by Dr. Jess House and Dr. William C. Bozeman. They are randomly excerpted and it is not intended that they be taken as a full expression of the feelings of staff and students toward the CAI Project. They are presented here because it is believed that they give a view of the project that is difficult for the presenter to convey any other way. (Note: The inmates quoted are identified only by first name. Where inmates are identified by name in the text, a fictitious name has been substituted.)

"You have to remember that we've taken the incorrigibles and put them back in the classroom."

Charles Schulz, Director
Correctional Education
Programs, SCC

The program prior to the beginning of the computer-assisted instruction component was primarily a paper and pencil, individual tutorial type program conducted by the three teachers involved in the project. The setting down there is very spartan, materials are often lacking, students are difficult, and the range of abilities is almost staggering.

Bill Hierstein
Assistant to the President
SCC

"they is a lot of adjusting to do. You got to understand that this is no public high school."

Inmate Jack, ISP

Beyond this group, a couple of students were working at computers positioned on either side of a support post in the middle of the room. Rita, the lab monitor, was assisting these students. Against the far wall, several more inmates were working at a row of computers in study carrels. They, like the first two students, appeared to be absorbed in their work.

One of the fellows in the group near the far wall was a unusually large student, Mark. He seemed to be particularly involved in his work at the computer. As the observer walked past, Mark turned from his screen to his neighbor's and exclaimed, "Look at this! Read what that says! Would you look at this? Look what it's saying?" The screen read: "We'll go back and practice part of the work again." The inmates the massive figure had addressed, acknowledged his enthusiastic comments briefly, but quickly returned to their own computers.

Jess House
Project Consultant

"The computer allows you to do the parts you need more work on over again as many times as you want. It repeats until you feel like you got it."

Inmate Don, ISP

A fight broke out between two students in the JBC classroom. Steve placed a disk in the disk drive of a computer, and put a book down near the keyboard. He left for a moment to get some other materials before returning to work at the computer. When he returned to the computer, his seat was occupied by Bob, who was chatting with other students. Steve demanded that Bob vacate the chair. A fight ensued. Steve was taken away by a guard, and Bob was taken to the hospital for facial lacerations...A prison official reported, "While Bob was getting whaled, he kept yelling, 'Watch out for the computers--watch out for the computers!'"

Jess House
Project Consultant

You have to realize that people are on different levels of school...Some young guys have just come from high school. You got to realize we got guys like myself, I haven't been to school is 20 some. You got Mr. Washington that comes down here who hasn't been to school in 40 years -- that's a lot of changing to do, so he's on a different level. Some older guys never seen one (computer) cause they been in jail for 20. I've been in for 10.

Say you got a young guy just come to the penitentiary. He got to adjust to the environment. He might have a different attitude. Say he got his case in appeal today and lost his case, they got a different attitude.

This is a penitentiary. You got to adjust to the change of life. Sometimes it takes 4 or 5 years to adjust to this environment.

Inmate John, ISP

I would have liked more time to train... (on topics specific to his area, English and writing). I needed more time to learn a word processor. As it turns out, doing it on my own it took me a lot less time to learn how to use it than I thought. But there are still a lot of things I need to know about it. I don't know how to do that yet and I need somebody looking over my shoulder. Just getting used to the computer itself--there's not time for that and it's been from sheer taking time out (from other things). We need more preview time for software. We get something in, and we don't know how to use it, and we don't have time to figure out how to use it.

Thomas Hayes
Instructor, SCC

"I would have liked more time alone with the computers--more time spent reviewing programs."

June Mudd
Instructor, SCC

"I worry about incorporating the software with what I teach now."

Jerry Schulz
Instructor, SCC

I see it as refining adult basic education skills in a self-paced computerized style. (The warden had seen CAI used for the development of adult basic education elsewhere) ...this type of program can really individualize instruction. The program can improve the educational skills. It teaches material on an individual basis. It doesn't give a person an inferiority complex....We were looking for a way to strengthen the educational program.

Warden Crispus Nix
ISP/JBU

...Inmates don't like to do team sports. They'd rather win or lose on their own. They don't work well with group instruction. They work better individually.

...The project can develop self-esteem, self-worth. It (the problem of low educational attainment) could cost less now than to deal with it later.

Warden Crispus Nix
ISP/JBU

For some time before the project got started, I had felt that the adult basic education program was in quite a valley. The students and faculty needed a shot in the arm. The staff was becoming complacent, lethargic. We were on the lookout for something to rekindle the whole process.

Charles Schulz
Director of Correctional
Education Programs, SCC

...impressions were mixed--disbelief and pretty excited. I sacrificed my classroom so the lab could be put in there. I'm very positive about it. We've changed the adult basic education program four times in ten years. Each was an improvement. Before the CAI project, we were turning into a paper and workbook institution.

Jerry Schulz
Instructor, SCC

COMMENTING AFTER THE FIRST DAY OF STUDENT PARTICIPATION IN THE PROGRAM

"Great! If we get one-quarter of the response that we did today, it'll be worth it all. ...I have one student who told me he wanted nothing to do with the computer--he never hit a wrong key the entire morning and what's more, he thanked me. He's certainly never done that before."

June Mudd
Instructor, SCC

COMMENTING AFTER THE FIRST TWO MONTHS OF PROJECT OPERATIONS

When this first started, I was unbelievably skeptical... I think it has given us a tool to reach students that were otherwise unreachable. I wouldn't think that was possible but it's true. I've even had students that said initially that they would never touch computers and both of them practically everyday asking me when they can go on the machine again. Those were people who didn't have a whole lot of interest in school for various reasons.

Tom Hayes
Instructor, SCC

Because it adds more energy to the outreach in trying to get as many people as they can involved in uplifting the academic skills. A guy might want to come in and play a space game...and in the process of playing the space game he might see something of benefit. I think it has a real positive effect. In fact, I know it does.

...I think it's kind of inspirational . In that aspect it is a positive achievement.

Inmate Nick, JBU

This is the computer age. You gotta know how to use it... I think we should use them more. If the computer has something like in a book, why not use the computer? Some guys cheat in a book. Computers are not like that. It may have some answers but it makes you work hard to get the answer and then tells you whether you got it right or wrong.

Inmate Jerold, ISP

Seems like most of these guys get interested in this. I've seen a lot come in here that I know would do nothing; but after they come in and work on the computers, they just keep on coming back. That's pretty good.

Inmate James, JBU

As a matter of fact, I think it's the best thing that came to Iowa State Prison besides getting paroled. It has tremendous possibilities for any person to come down here and learn something that is going to get them ready out there for society.

Inmate Richard, ISP

You have to be patient. The computer is going to be patient cause it's a machine. You have to teach a guy how to operate it, get the software to fit this man's ability. I'm pretty sure the computer thing's going to work.

Inmate Perkins, ISP

COMMENTING ON THE DIFFICULTY IDENTIFYING AND PURCHASING SOFTWARE

"I wish all of the software was here today...The real problem is that we're used to buying textbooks. We thought we could just go right out and buy some. We really didn't know we'd run into that, guess we should've realized that. But, you can get one book for $3.98 and send it back if you don't like it. It's difficult to get a preview (of software), they (the publishers) send you just pieces, and they don't tell you what you want to know."

Charles Schulz
Director of Correctional
Education Programs, SCC

COMPUTER-ASSISTED INSTRUCTION

by

William C. Bozeman

Computer-assisted instruction (CAI) is generally considered to be a curricular program wherein an interaction exists between the student and the computer for the purpose of instruction. Usually one student communicates with the computer system via a terminal or CRT/keyboard. The computer supporting the CAI system could be a large or medium-sized timesharing system delivering instruction to multiple users at different locations or a stand-alone microcomputer serving one student (in this proposal, the delivery system will utilize microcomputers). Learning activities can be provided in the form of drill and practice, tutorials, games, or simulations.

CAI is often thought to be a new teaching innovation but actually we find applications dating back to the 1950s. This period, particularly the 1960s, was a time in which educators were especially interested in programmed instruction and, to some extent, teaching machines. CAI may incorporate many of the philosophical and pedagogical principles and ideas found in programmed instruction. One should not, however, infer that CAI is nothing more than programmed instruction enhanced by computer-based technology. The computer can control presentation and sequence of information based on student performance in a fashion not possible with earlier systems of programmed instruction. Furthermore, the computer can provide many modes of feedback, remediation, varying levels of difficulty, as well as present graphics materials, audio, and control audiovisual devices (e.g., tape recorder, slide projector, movie projector, etc.).

As previously stated, there are several different modes of sub-categories of CAI. Drill and practice was one of the early forms of instructional computing. It may be compared to the "flash card" method of teaching math, spelling, or other facts. The student is presented with a question, problem, computational item, etc., and must respond by entering the answer at the keyboard or through some device coupled with the system (such as a light pen). As in the case of conventional drill and practice media, the routing is generally a supplemental activity to instruction provided in the classroom.

The program or CAI lesson may be enhanced by adding diagnostic tests or pretests to determine difficulty levels of items presented and post-tests to assess mastery. Other features such as feedback, praise, critical analysis, and record keeping may be included in addition to the straightforward presentation of items.

Tutorial programs, as the name suggests, emulate the private teacher or tutor. Their frame-by-frame format resembles conventional programmed instruction materials in that text is presented along with questions which permit branching to other text based upon the student's response. Tutorial CAI can provide a great part of the actual instruction as compared to drill and practice which is used to supplement other teaching methods.

Material is presented to the student in a fashion similar to the way a human teacher might. At various intervals, questions are asked and, based upon the response, additional material is offered. The program determines when new concepts or information are appropriate and when review is needed. In a sense, the interaction between the computer and student resembles a dialogue or conversation.

Simulations are computer programs which model reality. Stated another way, a model (usually mathematical) is developed which represents a real life situation. Use of simulations is especially valuable when actual experimentation or real experiences may not be possible or could be dangerous. For example, students may make simulated business decisions without having to face the consequences of a real management situation or a dangerous chemistry experiment can be conducted without the usual concerns for safety.

One of the advantages readily apparent in CAI systems is the ability to have students proceed through some sequence of instruction at their own pace. A student who has demonstrated mastery of some topic or set of objectives can move along to new material without having to wait for others to "catch-up" and possibly become bored or disinterested. Likewise, a student experiencing some difficulty may move at a slower rate until the lesson has been satisfactorily completed. During this time she/he will not suffer the embarrassment or anxiety that often accompanies "being slow" or requiring more time than others in the class. These advantages of CAI are considered quite important and relevant to the application discussed in this proposal.

In certain learning situations, it might be appropriate to have the computer "pace" the student through a set of activities or exercises. This is easily accomplished since the computer has a clock of its own and can permit only some predetermined length of time per item, for example, or it could report to the student or teacher the amount of time it recorded for the activity to be completed.

Feedback and positive or negative reinforcement can be provided immediately to the student during a CAI lesson. Learning theory would suggest that there is considerable merit in this. The student can know as soon as a question is answered whether the response was correct and even why it was not correct. Computer graphics and audio systems can generate interesting and even entertaining feedback in the case of right and wrong answers.

An important but difficult issue concerns the effectiveness of CAI as compared with traditional modes of instruction. The literature is filled with research related to CAI effectiveness including student achievement, student attitudes, time savings, learning retention and costs. The conclusion of most of these studies is that an instructional program supplemented with CAI is at least as effective as, and frequently more effective than, a program using only traditional instruction methods. Furthermore, CAI-supplemented instruction may likely lead to higher performance levels than normal instruction alone. Additionally, less time may be required for learning through CAI than through other methods.

In summary, the support of instruction through a CAI systems offers the potential for considerable enhancement of education. There is no reason why the nature of the instructional environment addressed in this proposal should offer any obstacles or limitations which cannot be dealt with. In fact, there is every reason to believe that a computer-based instructional delivery system may be ideal for this group of students.

S O F T W A R E P U R C H A S E L I S T

Date Ordered	Description	Vendor	Price
01-Feb-85	PDS 166 A.P.P.L.E.	MECC	$2
01-Feb-85	PDS 118 A.P.P.L.E.	MECC	2
01-Feb-85	PDS 116 A.P.P.L.E.	MECC	2
01-Feb-85	Mind Puzzler	MECC	5
01-Feb-85	Computers in Teaching Vol 1	MECC	5
01-Feb-85	Computers in Teaching Vol 2	MECC	5
01-Feb-85	Designing Instr Cmp Mtls	MECC	5
01-Feb-85	Teacher Utilities Vol 1	MECC	5
01-Feb-85	Teacher Utilities Vol 2	MECC	5
01-Feb-85	Teacher Utilities Vol 3	MECC	5
01-Feb-85	Elementary Vol 3, SS	MECC	5
01-Feb-85	Elementary Vol 2 LA	MECC	5
01-Feb-85	Writing a Character Sketch	MECC	3
01-Feb-85	Writing a Narrative Sketch	MECC	3
01-Feb-85	Data Handler	MECC	5
01-Feb-85	Computing Tools: Databases	MECC	5
01-Feb-85	Word Wizards	MECC	5
01-Feb-85	EZ Pilot	MECC	5
01-Feb-85	Softswap #1	MECC	2
01-Feb-85	Softswap #2	MECC	2
01-Feb-85	Alg I #5	MECC	2
01-Feb-85	Alg I #6	MECC	2
01-Feb-85	Alg I #7	MECC	2
01-Feb-85	Alg I #8	MECC	2
01-Feb-85	Alg I #9	MECC	2
01-Feb-85	Alg I #10	MECC	2
01-Feb-85	Alg II #1	MECC	2
01-Feb-85	Alg II #2	MECC	2
01-Feb-85	Alg II #3	MECC	2
01-Feb-85	Alg II #4	MECC	2
01-Feb-85	Alg II #5	MECC	2
01-Feb-85	Alg II #6	MECC	2
01-Feb-85	Circus Math	MECC	5
01-Feb-85	Comp Math Mtls Vol 1	MECC	5
01-Feb-85	Comp Math Mtls Vol 2	MECC	5
01-Feb-85	Early Addition	MECC	5
01-Feb-85	Elem Geom Vol 8	MECC	5
01-Feb-85	Elem Geom Vol 9	MECC	5
01-Feb-85	Estimation	MECC	5
01-Feb-85	Geom 1,2,3,4,5	MECC	2
01-Feb-85	Geom Tchr Generated	MECC	2
01-Feb-85	Growgins Fractions	MECC	5
01-Feb-85	Math Vol 1	MECC	5
01-Feb-85	Math Vol 3	MECC	5
01-Feb-85	Mdl Sch Disk #4	MECC	2
01-Feb-85	Mdl Sch Disk #5	MECC	2
01-Feb-85	Mdl Sch Disk #6	MECC	2
01-Feb-85	Mdl Sch Disk #8	MECC	2
01-Feb-85	Mdl Sch Disk #9	MECC	2
01-Feb-85	Mdl Sch Disk #10	MECC	2
01-Feb-85	Softswap #3	MECC	2

S O F T W A R E P U R C H A S E L I S T

Date Ordered	Description	Vendor	Price
01-Feb-85	Softswap #4	MECC	2
01-Feb-85	Softswap #5	MECC	2
01-Feb-85	Twofaced Fractions	MECC	2
05-Feb-85	Elem Vol 12 LA	MECC	4
05-Feb-85	Eng Parts of Speech	MECC	4
05-Feb-85	Word Wizards	MECC	2
05-Feb-85	PDS 116 A.P.P.L.E.	MECC	2
05-Feb-85	PDS 118 A.P.P.L.E.	MECC	2
05-Feb-85	PDS 166 A.P.P.L.E.	MECC	2
05-Feb-85	Softswap #1	MECC	2
05-Feb-85	Softswap #2	MECC	2
05-Feb-85	Softswap #3	MECC	2
05-Feb-85	Softswap #4	MECC	2
05-Feb-85	Softswap #5	MECC	2
05-Feb-85	Biomes and Food Webs	MECC	7
05-Feb-85	Elem Vol 3 SS	MECC	2
05-Feb-85	Asexual Repro	MECC	7
05-Feb-85	Exploring the Brain	MECC	7
05-Feb-85	Elem Vol 2 LA	MECC	2
05-Feb-85	Food Facts Vol 1	MECC	7
05-Feb-85	Health Maint Vol 1	MECC	7
05-Feb-85	Oh Deer	MECC	7
05-Feb-85	Science Vol 1	MECC	7
05-Feb-85	Science Vol 2	MECC	7
05-Feb-85	Science Vol 3	MECC	7
06-Feb-85	Writing Lab Systems	Gorilla Software	349
07-Feb-85	Content Areas	Opp for Learning	239
07-Feb-85	Punc & Cap	Opp for Learning	175
11-Feb-85	Apple Works	Local Vendor	250
11-Feb-85	Bank Street Writer (2)	Silicon Express	88
11-Feb-85	Math Blaster (2)	Silicon Express	66
11-Feb-85	PFS:File (2)	Silicon Express	150
11-Feb-85	PFS: Report	Silicon Express	75
11-Feb-85	Print Shop	Silicon Express	35
11-Feb-85	Rocky's Boots	Silicon Express	32
11-Feb-85	Typing Tutor II (2)	Silicon Express	34
11-Feb-85	Milliken Math Sequences	Milliken	450
22-Feb-85	Milliken Language Arts	Milliken	76
22-Feb-85	Confusing Verbs	Intellectual	37
22-Feb-85	Agreeable Verbs	Intellectual	37
22-Feb-85	Pronoun Agreement	Intellectual	37
22-Feb-85	Intro to Punct	Intellectual	37
22-Feb-85	Usage	Intellectual	37
22-Feb-85	Mouse Maze	MECC	5
22-Feb-85	Elem Vol 11, LA	MECC	2
22-Feb-85	Elem Vol 2, LA	MECC	2
22-Feb-85	Elem Vol 5	MECC	2
22-Feb-85	Master Spell	MECC	2
22-Feb-85	Reading and Lit	MECC	2
22-Feb-85	Softswap #6	MECC	2
22-Feb-85	Spelling Vol 1	MECC	2

S O F T W A R E P U R C H A S E L I S T

Date Ordered	Description	Vendor	Price
22-Feb-85	Spelling Vol 2	MECC	2
22-Feb-85	Word Herd: Look Alikes	MECC	2
22-Feb-85	Word Herd: Sound Alikes	MECC	2
22-Feb-85	Word Wizards	MECC	2
22-Feb-85	Writing a Chrcter Sktch	MECC	2
22-Feb-85	Writing a Narrative	MECC	2
22-Feb-85	Adventures w/Fractions	MECC	2
22-Feb-85	Algebra I #1	MECC	2
22-Feb-85	Algebra I #2	MECC	2
22-Feb-85	Algebra I #3	MECC	2
22-Feb-85	Algebra I #4	MECC	2
22-Feb-85	Algebra I #5	MECC	2
22-Feb-85	Algebra I #6	MECC	2
22-Feb-85	Algebra I #7	MECC	2
22-Feb-85	Algebra I #8	MECC	2
22-Feb-85	Algebra I #9	MECC	2
22-Feb-85	Algebra I #10	MECC	2
22-Feb-85	Educational Disk #1 (2)	MECC	4
22-Feb-85	Elem Vol 4 Math/Sci	MECC	2
22-Feb-85	Growgins Fractions	MECC	2
22-Feb-85	Math Vol 1	MECC	2
22-Feb-85	Math Vol 2	MECC	2
22-Feb-85	Math Vol 3	MECC	2
22-Feb-85	Math Vol 4	MECC	2
22-Feb-85	Mdl Sch #1	MECC	2
22-Feb-85	Mdl Sch #2	MECC	2
22-Feb-85	Mdl Sch #3	MECC	2
22-Feb-85	Mdl Sch #4	MECC	2
22-Feb-85	Mdl Sch #5	MECC	2
22-Feb-85	Mdl Sch #6	MECC	2
22-Feb-85	Mdl Sch #7	MECC	2
22-Feb-85	Mdl Sch #8	MECC	2
22-Feb-85	Mdl Sch #9	MECC	2
22-Feb-85	Mdl Sch #10	MECC	2
22-Feb-85	Mdl Sch #11 (2)	MECC	2
22-Feb-85	Mdl Sch #12 (2)	MECC	2
22-Feb-85	Mdl Sch #13 (2)	MECC	2
22-Feb-85	Twofaced Fractions	MECC	2
22-Feb-85	Elem Vol 3	MECC	2
22-Feb-85	Elem Vol 6	MECC	2
22-Feb-85	SS Vol 1	MECC	2
22-Feb-85	SS Vol 2	MECC	2
22-Feb-85	Microzine 7	MECC	5
22-Feb-85	Alg I #11	MECC	2
22-Feb-85	Alg II #10	MECC	2
22-Feb-85	Alg II #11	MECC	2
22-Feb-85	Alg II #7	MECC	2
22-Feb-85	Alg II #8	MECC	2
22-Feb-85	Alg II #9	MECC	2
22-Feb-85	Geom #6	MECC	2
22-Feb-85	Multiwork	MECC	2

S O F T W A R E P U R C H A S E L I S T

Date Ordered	Description	Vendor	Price
22-Feb-85	Pre-Reading	MECC	5
22-Feb-85	Earth Sci	MECC	5
22-Feb-85	Market Place	MECC	5
19-Apr-85	Spelling Machine: Context and Rules	Learning Arts	39
19-Apr-85	101 Misused Words	Learning Arts	39
19-Apr-85	The Great Divide (Media Materials)	Queue	40
19-Apr-85	Vocabulary Skills: Context Clues	Queue	50
19-Apr-85	Writing Competency Program	Opportunities for Learning	115
03-May-85	Algebra II #7	MECC	2
03-May-85	Albegra II #8	MECC	2
03-May-85	Algebra II #9	MECC	2
03-May-85	Geometry #6	MECC	2
03-May-85	Middle School #11	MECC	2
03-May-85	Middle School #12	MECC	2
03-May-85	Multiwork	MECC	2
03-May-85	Pre-Reading	MECC	5
03-May-85	Earth Science	MECC	5
03-May-85	Market Place	MECC	5
17-Jun-85	Microcomputer Bibliography for ABE/GED/ Basic Skills Instruction	New Jersey Adult Ed Diss Proj	10
08-Jul-85	Sentences	Intellectual	35
08-Jul-85	The Compound Sentence	Intellectual	35
09-Jul-85	Pro-Grammar Diskettes	South Western	45
09-Jul-85	Pro-Sentence Diskettes	South Western	45
09-Jul-85	Text workbooks (4)	South Western	18
24-Jul-85	Fractions Sequence	Milliken	40
24-Jul-85	Decimal Sequence	Milliken	40
24-Jul-85	Percent Sequence	Milliken	40
24-Jul-85	Measurement Formulas Sequence	Milliken	40
25-Jul-85	Writing Skills Bank	Scholastic	60
25-Jul-85	Writing Activities & Language Skills	Scholastic	60
25-Jul-85	Bank Street Writer Activity Book (10)	Scholastic	43
25-Jul-85	Middle School #11	MECC	2
25-Jul-85	Middle School #12	MECC	2
25-Jul-85	Middle School #13	MECC	2
25-Jul-85	Algebra I #11	MECC	2
25-Jul-85	Algebra II #1	MECC	2
25-Jul-85	Algebra II #2	MECC	2
25-Jul-85	Algebra II #3	MECC	2
25-Jul-85	Algebra II #4	MECC	2
25-Jul-85	Algebra II #5	MECC	2
25-Jul-85	Algebra II #6	MECC	2
25-Jul-85	Algebra II #7	MECC	2
25-Jul-85	Algebra EE #8	MECC	2
25-Jul-85	Algebra II #9	MECC	2
25-Jul-85	Algebra II #10	MECC	2
25-Jul-85	Algebra II #11	MECC	2
25-Jul-85	Spelling Vol #1	MECC	2
25-Jul-85	Spoelling vol #2	MECC	2
25-Jul-85	Word Herd "Look Alikes"	MECC	2

S O F T W A R E P U R C H A S E L I S T

Date Ordered	Description	Vendor	Price
22-Feb-85	Pre-Reading	MECC	5
22-Feb-85	Earth Sci	MECC	5
22-Feb-85	Market Place	MECC	5
19-Apr-85	Spelling Machine: Context and Rules	Learning Arts	39
19-Apr-85	101 Misused Words	Learning Arts	39
19-Apr-85	The Great Divide (Media Materials)	Queue	40
19-Apr-85	Vocabulary Skills: Context Clues	Queue	50
19-Apr-85	Writing Competency Program	Opportunities for Learning	115
03-May-85	Algebra II #7	MECC	2
03-May-85	Albegra II #8	MECC	2
03-May-85	Algebra II #9	MECC	2
03-May-85	Geometry #6	MECC	2
03-May-85	Middle School #11	MECC	2
03-May-85	Middle School #12	MECC	2
03-May-85	Multiwork	MECC	2
03-May-85	Pre-Reading	MECC	5
03-May-85	Earth Science	MECC	5
03-May-85	Market Place	MECC	5
17-Jun-85	Microcomputer Bibliography for ABE/GED/ Basic Skills Instruction	New Jersey Adult Ed Diss Proj	10
08-Jul-85	Sentences	Intellectual	35
08-Jul-85	The Compound Sentence	Intellectual	35
09-Jul-85	Pro-Grammar Diskettes	South Western	45
09-Jul-85	Pro-Sentence Diskettes	South Western	45
09-Jul-85	Text workbooks (4)	South Western	18
24-Jul-85	Fractions Sequence	Milliken	40
24-Jul-85	Decimal Sequence	Milliken	40
24-Jul-85	Percent Sequence	Milliken	40
24-Jul-85	Measurement Formulas Sequence	Milliken	40
25-Jul-85	Writing Skills Bank	Scholastic	60
25-Jul-85	Writing Activities & Language Skills	Scholastic	60
25-Jul-85	Bank Street Writer Activity Book (10)	Scholastic	43
25-Jul-85	Middle School #11	MECC	2
25-Jul-85	Middle School #12	MECC	2
25-Jul-85	Middle School #13	MECC	2
25-Jul-85	Algebra I #11	MECC	2
25-Jul-85	Algebra II #1	MECC	2
25-Jul-85	Algebra II #2	MECC	2
25-Jul-85	Algebra II #3	MECC	2
25-Jul-85	Algebra II #4	MECC	2
25-Jul-85	Algebra II #5	MECC	2
25-Jul-85	Algebra II #6	MECC	2
25-Jul-85	Algebra II #7	MECC	2
25-Jul-85	Algebra EE #8	MECC	2
25-Jul-85	Algebra II #9	MECC	2
25-Jul-85	Algebra II #10	MECC	2
25-Jul-85	Algebra II #11	MECC	2
25-Jul-85	Spelling Vol #1	MECC	2
25-Jul-85	Spoelling vol #2	MECC	2
25-Jul-85	Word Herd "Look Alikes"	MECC	2

S O F T W A R E P U R C H A S E L I S T

Date Ordered	Description	Vendor	Price
25-Jul-85	Word Herd "Sound Alikes"	MECC	2
25-Jul-85	Softswap Vol #1	MECC	2
25-Jul-85	Softswap Vol #3	MECC	2
25-Jul-85	Softswap Vol #6	MECC	2
29-Jul-85	Programmer's Aid Vol 1	MECC	2
29-Jul-85	Programmer's Aid Vol 2	MECC	2
29-Jul-85	Study Guide	MECC	2
29-Jul-85	Discover Basic	MECC	2
29-Jul-85	The Spelling Machine: Context & Rules (backup)	Learning Arts	8
29-Jul-85	101 Misused Words (backup)	Learning Arts	8
01-Aug-85	Customized Reading Mastermind - Inferences	Educational Record Sales	35
22-Aug-85	Math Word Problems-Gr 7	Intellectual	35
22-Aug-85	Math Word Problems - Gr 8	Intellectual	35
22-Aug-85	Practical Composition, Pkg 1	Intellectual	155
22-Aug-85	Practical Vocabulary	Intellectual	75
22-Aug-85	Practical Spelling	Intellectual	30
28-Aug-85	Compu-Read	Scholastic	30
28-Aug-85	American History 1	Scholastic	27
28-Aug-85	American History 2	Scholastic	27
27-Aug-85	US Constitution Tutor	Queue	35
27-Aug-85	General Biology	Queue	35
27-Aug-85	Behavioral Sciences	Queue	35
27-Aug-85	Earth Science Review	Queue	30
27-Aug-85	Chemistry Test I	Queue	30
27-Aug-85	Reading and Thinking	Queue	75
27-Aug-85	Sensible Speller	Career Aids, Inc	125
27-Aug-85	Microtype II	Career Aids, Inc	10
27-Aug-85	Typing Strategy	Career Aids, Inc	50
09-Sep-85	Apple Special Features	MECC	5
09-Sep-85	Experiencing Procedures	MECC	5
09-Sep-85	The IFs and THENs of Programming	MECC	5
09-Sep-85	The Three Rs of Microcomputing	MECC	5
09-Sep-85	101 Activities for Computer Classes	MECC	3
09-Sep-85	Hi-Res Toolkit	MECC	5
09-Sep-85	Introduction to LOGO for Teachers	MECC	5
09-Sep-85	Master Spell	MECC	2
09-Sep-85	Elementary Vol II	MECC	2
21-Sep-85	Bank Street Writer Activity Books (10)	Scholastic	43
21-Oct-85	Success with Math: Decimals, Addition/ Subtraction	CBS	25
21-Oct-85	Success with Math: Multiplication/ Division	CBS	25
21-Oct-85	Writen Expression Series	K-12 MicroMedia	250
21-Oct-85	The Medalists: Black Americans	K-12 MicroMedia	40
21-Oct-85	Reading & Thinking III & IV	K-12 MicroMedia	110
21-Oct-85	Roots & Affixes	K-12 MicroMedia	40
21-Oct-85	Winning with Phonics	K-12 MicroMedia	40
21-Oct-85	Word Alert-Clue In	K-12 MicroMedia	50
21-Oct-85	The Medalists: Continents	K-12 MicroMedia	40

S O F T W A R E P U R C H A S E L I S T

Date Ordered	Description	Vendor	Price
21-Oct-85	Everyday Math Series	K-12 MicroMedia	165
21-Oct-85	Vocabulary Challenge	K-12 MicroMedia	40
21-Oct-85	The Typewriter	Software Publishing Corporation	20
21-Oct-85	AlphaChart and CurvePlotter	Spectral Graphic	45
21-Oct-85	Wedding Text Bold	Varityper Corp.	114
21-Oct-85	Park Avenue	Varityper Corp.	114
21-Oct-85	Murry Hill Bold	Varityper Corp.	114
21-Oct-85	Wave	Varityper Corp.	114
21-Oct-85	Following Directions	Steck-Vaughn Co.	28
21-Oct-85	Locating the Answer	Steck-Vaughn Co.	28
21-Oct-85	Getting the Main Idea	Steck-Vaughn Co.	28
21-Oct-85	Detecting the Sequence	Steck-Vaughn Co.	28
21-Oct-85	Using the Context	Steck-Vaughn Co.	28
21-Oct-85	Drawing Conclusions	Steck-Vaughn Co.	28
21-Oct-85	GED 100	Steck-Vaughn Co.	975
21-Oct-85	Print Shop Graphics #1 & #2	Silicon Express	30
21-Oct-85	Word Attack	Silicon Express	30
21-Oct-85	Word Attack Data Disk	Silicon Express	15
21-Oct-85	Keys to Responsible Driving	Silicon Express	56
21-Oct-85	Spellicopter	Silicon Express	24
21-Oct-85	States & Traits	Silicon Express	31
21-Oct-85	Spell-It	Silicon Express	35
21-Oct-85	Easy Graph	Silicon Express	28
21-Oct-85	Fractions	Silicon Express	31
21-Oct-85	Educalc	Silicon Express	35
21-Oct-85	Additonal Graphics and Fonts for Newsroom	Silicon Express	14
21-Oct-85	The Newsroom	Silicon Express	35
21-Oct-85	Sensible Speller for ProDos	Silicon Express	32
21-Oct-85	Decimals	Silicon Express	33
21-Oct-85	Decimal Word Problems	Opportunities for Learning	25
21-Oct-85	Percent Word Problems	Opportunities for Learning	25
21-Oct-85	Mixed Numbers	Opportunities for Learning	50
21-Oct-85	Job Hunting Skills	Media Materials	35
21-Oct-85	On-the-Job Communication	Media Materials	35
21-Oct-85	Practical Vocabulary	Intellectual	30
21-Oct-85	Practical Composition	Intellectual	40
21-Oct-85	Practical Spelling	Intellectual	10
21-Oct-85	Working with Sentences	Intellectual	185
21-Oct-85	Dictionary Skills	Intellectual	25
21-Oct-85	Word Wizards	MECC	4
21-Oct-85	Elementary Vol #5	MECC	4
21-Oct-85	Fundamentals of Chemistry	MECC	2
21-Oct-85	Science	MECC	4
21-Oct-85	Viscious Circle	MECC	4
21-Oct-85	Polls & Politics	MECC	4
21-Oct-85	Business Vol #3	MECC	5

S O F T W A R E P U R C H A S E L I S T

Date Ordered	Description	Vendor	Price
21-Oct-85	Payroll System	MECC	5
21-Oct-85	Reconciliation Statement	MECC	2
21-Oct-85	Light & Camera	MECC	2
21-Oct-85	Computer Lab Guidebook	MECC	3
21-Oct-85	Elementary Keyboarding	MECC	10
21-Oct-85	Discovery Lab	MECC	10
21-Oct-85	Stuff N Fetch	MECC	10
21-Oct-85	Check Your Objectivity	MECC	2
21-Oct-85	MECC Writer	MECC	10
21-Oct-85	Math Management	MECC	5
21-Oct-85	Math Diagnostics	MECC	5
21-Oct-85	Basketball Stats	MECC	5
21-Oct-85	Prism	MECC	2
21-Oct-85	Quotient Quest	MECC	5
21-Oct-85	The Resume: Presenting Yourself in Writing	Career Aids, Inc	65
	Computer Managed Edition English Form GED Practice Tests (2)	Cambridge	140
23-Oct-85	Confusing Words	MECC	2
23-Oct-85	Homonyms	MECC	2
23-Oct-85	Noun	MECC	2
23-Oct-85	Poetic License-Alliteration	MECC	2
23-Oct-85	Prepositional Phrases	MECC	4
23-Oct-85	Using To, Too, and Two	MECC	2
15-Nov-85	Add with Carry	Microcomputer Workshops	30
15-Nov-85	Subtraction	Microcomputer Workshops	30
15-Nov-85	1-2-3 Digit Multiplication	Microcomputer Workshops	30
15-Nov-85	Long Division	Microcomputer Workshops	30
05-Dec-85	The Typewriter (backup)	PowerUp!	5
05-Dec-85	Spell It! (backup)	Davidson & Assoc	10
05-Dec-85	Word Attack! (backup)	Davidson & Assoc	10
05-Dec-85	The Medalist: Black Americans (backup)	Hartley Courseware	12
05-Dec-85	Roots/Affixes (backup)	Hartley Courseware	12
05-Dec-85	The Medalists: Continents (backup)	Hartley Courseware	12
05-Dec-85	States & Traits (backup)	DesignWare	12
05-Dec-85	SpelliCopter (backup)	DesignWare	12
05-Dec-85	Fractions (backup)	DesignWare	12
05-Dec-85	Decimals (backup)	DesignWare	12
05-Dec-85	Traits Diskette	DesignWare	21
06-Dec-85	The Newsroom (backup)	SpringBoard Software	12
06-Dec-85	Clip Art Vol I (backup)	SpringBoard Software	12
09-Dec-85	Vocabulary Challenge (backup)	Learning Well	12

S O F T W A R E P U R C H A S E L I S T

Date Ordered	Description	Vendor	Price
09-Dec-85	Decimals	C.O.M.B. Co.	10
09-Dec-85	Fractions	C.O.M.B. Co.	10
09-Dec-85	Algebra I	C.O.M.B. Co.	10
09-Dec-85	Algebra III	C.O.M.B. Co.	10
11-Dec-85	Apple Tutor I	Computer Learning Center	4
11-Dec-85	Apple Tutor II	Computer Learning Center	4
11-Dec-85	Math & Statistics I	Computer Learning Center	4
11-Dec-85	Math & Statistics II	Computer Learning Center	4
11-Dec-85	Utility	Computer Learning Center	4
11-Dec-85	Business & Finance I	Computer Learning Center	4
11-Dec-85	Business & Finance II	Computer Learning Center	4
11-Dec-85	Business & Finance III	Computer Learning Center	4
11-Dec-85	Game I	Computer Learning Center	4
11-Dec-85	Game II	Computer Learning Center	4
		Total Cost:	$8,528

C.O.M.B. Company
14605 28th Avenue North
Minneapolis, MN 55441-3397

Cambridge
888 Seventh Avenue
New York, NY 10106

Career Aids, Inc.
Microcomputer Software
20417 Nordhoff Street - Dept U4
Chatsworth, CA 91311

CBS Software
One Fawcett Place
Greenwich, CT 06836

Computer Learning Center
P.O. Box 110876-J
Tacoma, WA 98411

Davidson & Associates
6069 Groveoak Place #12
Rancho Palos Verdes, CA 90274

DesignWare
EduWare
185 Berry Street
San Francisco, CA 94107

Educational Record Sales
157 Chambers Street
New York, NY 10007

Gorilla Software
3604 SW 31st Drive - 20-C
Gainesville, FL 32608

Hartley Courseware, Inc.
Dimondale, MI 48821

Intellectual Software
798 North Avenue
Bridgeport, CT 06606

K-12 MicroMedia
6 Arrow Road
Ramsey, NJ 07446

Learning Arts
P.O. Box 179
Wichita, KS 67201

Learning Well
200 South Service Road
Roslyn Heights, NY 11577

MECC
Minnesota Eduational Computing Consortium
3490 Lexington Avenue, N.
St. Paul, MN 55126
(612) 481-3500

Media Materials
Dept 85801
2936 Remington Avenue
Baltimore, MD 21211-2891

Microcomputer Workshops
225 Westchester Avenue
Port Chester, NY 10573

Milliken
1150 Research Avenue
St. Louis, MO 63132

New Jersey Adult Education Dissemination Project
Office of Adult Continuing Education
Glassboro State College - Triad Building/B-Wing
Glassboro, NJ 08028

Opportunities for Learning, Inc.
20417 Nordhoff Street, Room VC
Chatsworth, CA 91311

PowerUp!
Channelmark Corporation
2929 Campus Drive
San Mateo, CA 94403

Queue Educational Software
5 Chapel Hill Drive
Fairfield, CT 06432

Scholastic, Inc.
P.O. Box 7502
2931 East McCart Street
Jefferson City, MO 65102

Silicon Express
4555-11 Groves Road
Columbus, OH 43232

Software Publishing Corporation
P.O. Box 306
125 Main Street
Half Moon Bay, CA 94019

South Western Publishing Company
5101 Madison Road
Cincinnati, OH 45227

Spectral Graphics
6333 Pacific Avenue
Suite 256
Stockton, CA 95207

Springboard Software
7808 Creekridge Circle
Minneapolis, MN 55435

Steck-Vaughn Company
P.O. Box 2028
Austin, TX 78768

Varityper
11 Mt. Pleasant Avenue
East Hanover, NJ 07936

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